**Bridge Research Paper**

The Helix Bridge, previously known as the Double Helix Bridge, is a pedestrian [bridge](http://en.wikipedia.org/wiki/Bridge) linking Marina Center with [Marina South](http://en.wikipedia.org/wiki/Marina_South), in the [Marina Bay](http://en.wikipedia.org/wiki/Marina_Bay,_Singapore) area of [Singapore](http://en.wikipedia.org/wiki/Singapore). It was officially opened on April 24, 2010, however only half was opened due to ongoing construction at the Marina Bay Sands. It is located beside the [Benjamin Shears Bridge](http://en.wikipedia.org/wiki/Benjamin_Sheares_Bridge), and is accompanied by a transportation bridge, known as the [Bayfront Bridge](http://en.wikipedia.org/wiki/Bayfront_Bridge). The entire bridge was opened on July 18, 2010 to complete the entire walkway around Marina Bay.

The bridge highlights other major development projects planned in the area, including the highly awaited [Integrated Resort](http://en.wikipedia.org/wiki/Integrated_Resort) [Marina Bay Sands](http://en.wikipedia.org/wiki/Marina_Bay_Sands), in the [Singapore Flyer](http://en.wikipedia.org/wiki/Singapore_Flyer) [Gardens, by the Bay](http://en.wikipedia.org/wiki/Gardens_by_the_Bay).

The designing company is an international team teamed with Australian architects and Singapore based Architects. The bridge is expected to be the main point for the community, linking cultural, recreational, and entertainment facilities in the area, which were thanks for the overall pedestrian construction of Marina Bay. The bridge also functions as a gallery where children's paintings and drawings are exhibited for public viewing.

Canopies made of fritted-glass and perforated steel is put along parts of the inner spiral to provide shade for pedestrians. The bridge has five viewing platforms sited at locations that provide stunning views of the Singapore skyline, and events taking place within Marina Bay. At night, the bridge is illuminated by a series of lights that highlight the double-helix structure, therefore creating a special visual experience for the visitors.

There are two pairs of colored letters on the bridge, which are lit up at night in red and green. The [Land Transport Authority](http://en.wikipedia.org/wiki/Land_Transport_Authority) claims it is a world's first in architectural and engineering bridge design.

The construction of the bridge was undertaken by the teamwork by Sato Kogyo and TTJ Design and Engineering. Both companies have their full support to help to create this bridge. Sato Kogyo specialize in building a concrete bridge which is located parallel with the Helix bridge. In addition, the TTJ Design and Engineering Company lead in the fabrication and formation of the Helix Bridge.

The Helix is fabricated from stainless steel material, where approximately 650 tons of material is used to fabricate the bridge. This doesn’t include the 1000 tons of carbon steel material used in temporary structure, and also helping the bridge to get its unique shape.

This bridge is uniquely designed to change its whole color during the night. Hundred of workers have contributed in the completion of the bridge, and the pedestrians that use it undoubtedly feel there exceptional has paid off.

**Beam Bridge-** can have a span of up to 200 feet. Columns at the ends of the bridge support any weight on the bridge. The length of the bridge is limited because the

columns cannot support a lot of weight in the middle of the bridge.

**Arch Bridge-** can have a span of up to 1000 ft. The arch can support the weight on the bridge by distributing the weight to where the bridge touches the ground. This bridge is limited in size because as the arch becomes bigger, it can’t support as much weight.

**Suspension Bridge-** can have a span of 7000 feet! The bridge is attached to cables that are held up by two tall towers. The towers hold up most of the weight on the bridge.

Bridges have not always been as elaborate as they are today. The earliest ones were made of materials that were free and plentiful. In deep forests, people used beams made from small trees. In tropical regions where vegetation was thick, people wove together vines and grasses, and hung them to make walkways over rivers and gorges. Now, materials are diminishing and cost much more because of the decreasing amounts of them. Some bridges are made from what nature provides, however, most bridges are made of steel, stone, or reinforced concrete. All these materials are used for construction of bridges over rivers, gorges, or other wide spread areas of land. All throughout history, the materials and the way people have built bridges has changed.

Our group has constructed the Helix Bridge, which is classified as a beam bridge. We chose this bridge because we felt that it was uniquely shaped and constructed. The way it was made as research proved, was extremely amazing. In addition, the Helix Bridge is a truly fascinating bridge, however, it is located in a very small area. To our group this makes it special and distinctive to all who study and use it daily. Also, our group feels that the Helix Bridge was a great pick because it brought up many challenges, which our group can proudly say that they love to mangle with. As stated above, we modeled the Helix Bridge, which is an existing and real life bridge. Our group believes that physics is in building bridges. One example of this is